ASSIGNMENT

DATA COLLECTION:

* **User Profile**: collect data on user profile such as User ID, Username, Email.
* **Player interactions:** collect data on player interactions likechat messages, Friend requests, memberships, clickstream data.
* **In-game purchases:** collect data on purchases of in-game items or currency.
* **Time spent in the game**: Measure the time players spend in the game per session, Actions per session, Quests completed.
* **Device information:** Gather data on the device used by players.
* **Browser information:** Gather data on the browser used by players.
* **Network latency**
* **Events:** Track events like logins, logouts, game launches, etc.
* **Retention Data**: Churn rate (number of users who stop playing)

Retention rate (percentage of users who continue playing)

DATA PROCESSING:

**Preprocessing**: Clean and preprocess the collected data to remove noise and inconsistencies.

**Feature engineering:** Create new features that can help in understanding player behaviour and engagement.

**Data aggregation:** Aggregate data to different levels (daily, weekly, monthly) for analysis.

ANALYSIS:

**Descriptive Analytics:** Use to summarize and describe the collected data (e.g., average session duration, most popular cards).

**Predictive Analytics**: Predict future user behaviour (e.g., likelihood of churn based on gameplay patterns).

**Feature Importance Analysis:** Use techniques like Random Forests or XGBoost to identify the most important features affecting player retention.

ML/AI MODELS:

**Classification:** Determine factors that contribute to high or low retention rates (e.g., card upgrades, quest completion).

**Regression:** Analyze the impact of different variables on retention rates (e.g., time spent in-game, number of purchases).

**Clustering:** Apply clustering algorithms (e.g., K-means) to group players based on their behaviour patterns, which can help identify segments with different retention rates.

**Segmentation**: Segment users based on behaviour or demographics to tailor marketing strategies (e.g., high-spending users, casual players).

Recommendation Systems: Utilize recommendation algorithms (e.g., Collaborative Filtering, Content-Based Filtering) to suggest actions or content to players, potentially improving retention.

**Natural Language Processing (NLP):** Analyze chat messages for sentiment analysis to understand user satisfaction and engagement levels.

**Deep Learning:** Explore neural network models (e.g., LSTM, CNN) for sequence prediction tasks, such as predicting future player actions based on past behaviour.

**Time Series Analysis:** Analyze time-series data to understand trends and patterns in player behaviour over time, which can help in predicting future retention rates.

Model Evaluation:

Evaluate the performance of the models, using metrics like accuracy, precision, recall, F1-score, etc.

Validate the models using cross-validation or holdout validation techniques.

Insights and Recommendations:

Based on the analysis, provide actionable insights and recommendations to improve player retention, such as introducing new features, adjusting difficulty levels, offering personalized Experience

Flowchart